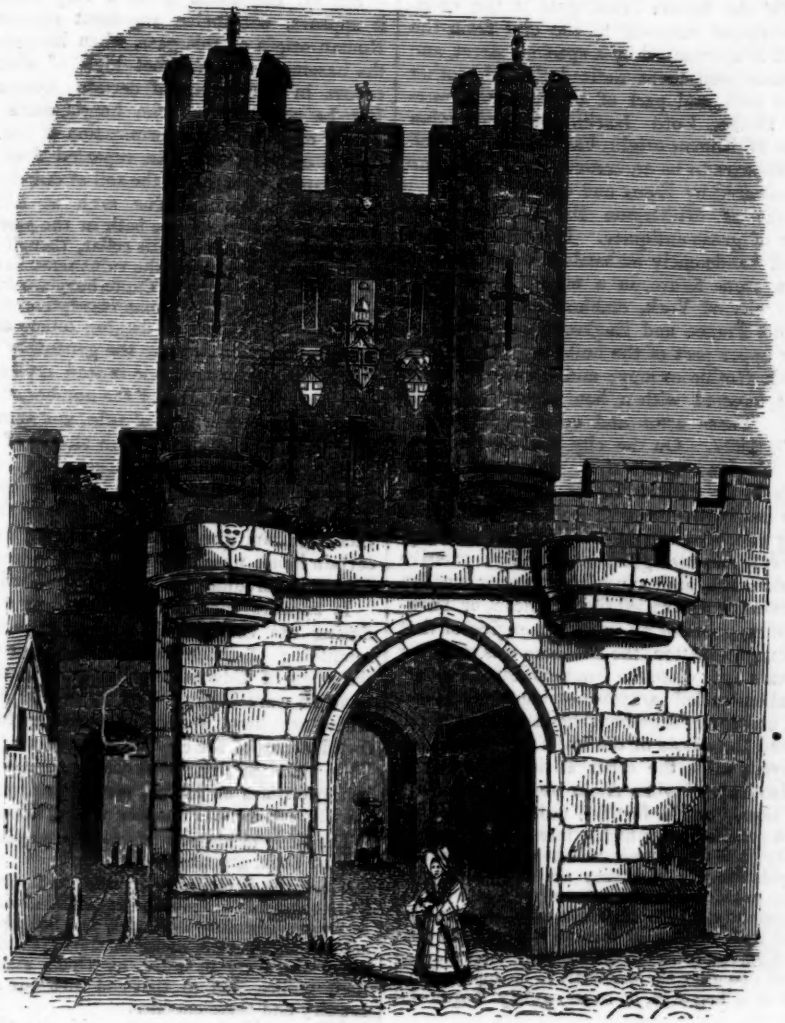
THE

Saturday Magazine.

No. 734. DECEMBER 9TH, 1843. { PRICE ONE PENNY.

THE BARS OF CITIES.



MICKLEGATE BAR, YORK.

The remains of ancient fortifications still existing in many parts of the kingdom, carry the mind back from the peace and security of our own times, to the contemplation of that period when such bulwarks were absolutely needed for the defence of our cities and towns; and if viewed in a proper light, they are calculated to promote feelings of gratitude and contentment. Whatever may be the real grievances existing in the present state of society, or the imaginary ones which a spirit of discontent may create to itself, we have only to look back to the time when city barriers (such as those we are about to describe) were necessary and indispensable, and we shall see cause to rejoice that the state of things which required them has now passed away, and that we have no need to restore such edifices, except as interesting architectural antiquities, and mementoes of by-gone times.

Among the most important defences of cities in those unsettled times, were massive and strongly fortified gateways, called "Bars," which were generally built over the principal roads of entrance to the city. These were furnished with various defensive contrivances of architecture, and were closed and watched during the night, or in any time of danger. These gates were also made to carry terror to the hearts of traitors, by the exhibition on their principal projections of the heads of those unhappy men who had been foremost in any rebellious incursion. Temple Bar, London, was too often thus frightfully decorated with human heads.

The Bar which forms the illustration to the present notice is that called Micklegate Bar, in the city of York. It is a curious and picturesque object, in a city abounding with interesting specimens of ancient architecture. The fame of York Cathedral has reached every part of the kingdom, but it is not so generally known that this

superb edifice is surrounded by other objects of interest, in the town gates, the embattled walls, the fragments of monastic edifices, the bridge, the remaining churches, &c.; so that the city displays examples of almost every age and style of castellated architecture, "from its pristine simplicity and rudeness, through all the stages of progressive improvement to perfection, and thence to its decline and fall." The city of York, indeed, may be looked upon as a model of an ancient city, and it is in this respect that its remaining bulwarks are especially interesting.

The walls of York contain four principal gates, and five posterns. Of the former Micklegate is the chief, and forms the principal entrance to the city from the London road. It is approached by a spacious street, and has in consequence been more noticed than the other bars. The inner arch, and part of the masonry, were considered by Drake, Lord Burlington, and other antiquaries, to be of Roman origin, but this, as we shall presently show, appears to be an erroneous opinion, and has been ably answered by Essex and others.

The appearance of Micklegate Bar is noble, and conveys the idea of great antiquity. It is adorned with lofty turrets, and handsomely embattled. On each of the turrets is a stone figure, in a menacing attitude. The arms of the city of York, emblazoned in colours, and those of Old France and England, quarterly, are displayed on the upper part of the building. Over each shield is a small Gothic canopy; and above the royal arms is a helmet, crested with a lion passant gardant, the whole gilt. These arms and crest were painted and gilt anew in 1827. On the city side are the arms of France and England quarterly. The ascent to the tower and walls is by double flights of stone steps. The roof of the Bar is covered with lead, and commands a very pleasing prospect of the surrounding country. There was formerly an outer gate, defended by a massive iron chain, a portcullis, and a "mighty strong wooden gate." This out-work was called the Barbican, or Turnpike, from its being guarded by a military engine of that name. According to Britton, the Barbican was standing about twenty years ago, when the front exhibited two circular turrets, and embattled parapets bearing the city arms on two shields, and three large lions' heads in bold relief. But the arch and the whole of the walls of the outwork are now destroyed, while the other ancient remains of the city were also in peril when Allen wrote his *History of York*. He says, "as the fortified walls of York constitute not only a peculiar, but a highly interesting historical feature to the city, it is truly lamentable to view the wanton and vulgar dilapidation to which they are daily subjected. Instead of being cautiously protected and preserved by the corporation, whose duty it is to guard and uphold them, and who are invested with an annual income for that purpose, they are suffered gradually to moulder away. Indeed, they are often battered down for the materials to be appropriated to the erection of a hog-stye, or some equally disgraceful purpose."

Respecting the antiquity of Micklegate Bar we have already stated that there is a difference of opinion among antiquaries. There are few remains of Roman work in England, in which hewn stones have been used, and it is considered a difficult point to determine what are Roman. The lower part of the structure we are now considering is of a grey stone of very coarse grit, while the upper walls and turrets are of fine white limestone. The lower part, therefore, has been considered as Roman workmanship, and Lord Burlington stated that the arch was either Roman, or built since Inigo Jones's time. But the marks by which the antiquity of the gate has been judged of, are not always to be depended on, and Mr. Essex remarks, that if Lord Burlington had examined the structure with attention, he would undoubtedly have pronounced it Norman. The same sort of materials employed by the Romans, were in use among the Saxons and Normans, long after their departure from Britain, and the method of disposing those materials was also the same. Indeed it would have been somewhat remarkable, had the methods of building employed by the conquerors suddenly ceased to exist on their leaving the island. Neither Britons nor Romans appear to have employed bricks in their buildings when any other material was at hand. Mr. Essex remarks that in situations where necessity obliged them to use them, they did it sparingly, either in making bands to strengthen their walls, or in turning of arches, for which purpose proper materials could not always be procured, they being often obliged to use small pebbles, or rag-stones, for the greatest part of their work.

Sir H. Englefield gives a very important, and, as it appears, conclusive argument against the supposed Roman origin of this gate, when he states the fact that the basement stands a foot high, of which no instance occurs in a building of certain Roman workmanship. For he remarks that the horrid waste and desolation which ensued on the termination of the Roman empire in this country, with the repeated fires of the Saxons and Danes, have raised the soil of our cities to an almost incredible height. "The arch at Lincoln is buried almost to its impost; the bath in the precentor's house is far below the bottom of his cellar, though on the brow of a steep hill down which the ruins must have rolled in some measure. The arches at Canterbury are nearly in the same state; and indeed the Roman inscriptions found at York are uniformly discovered in digging cellars and foundations." Such being the case with the generality of Roman antiquities in our island, it is indeed unlikely that Micklegate Bar, if it were one of the number, should alone have emerged from the mass of ruin, and should occupy a site level with that of the modern streets of York.

The upper part of this structure is referred to in the reign of Edward the Third. Drake mentions a record in the Pipe-office, by which it appears that one Benedict Fitz-engelram gave half a mark for license to build a certain house upon this bar, and sixpence annual rent for having it hereditary, in the eighth of Richard the First.

It appears that the city of York was fortified both during the Saxon and Danish governments, but the rebuilding of the walls is assigned with probability to the reign of Edward the First, about the time that the Scottish wars began. But in the reign of Edward the Third we have a regular mandate for repairing the fortifications of the city, dated Durham, July 15th, 1327. This mandate also shows the summary method adopted in those times of raising money for such purposes, and we will present our readers with a few extracts.

The King to his well-beloved the mayor and bailiffs of his city of York, greeting,—

Since the Scotch, our enemies and rebels, have thought fit to enter our kingdom near Carlisle, with all their power, as we are certainly informed, and kill, burn, destroy, and act other mischiefs as far as they are able, we have drawn down our army in order, by God's assistance, to restrain their malice, and to that end turn our steps towards that country and those enemies.

We, considering our aforesaid city of York, especially whilst Isabel, queen of England, our most dear mother, our brother and sisters, abide in the same, to be most safely kept and guarded, lest sudden danger should happen to the said city, or fear affright our mother, brother, and sisters, which God avert; we do command and charge you, upon your faiths and allegiance, and on the forfeiture of every thing you can forfeit to us, immediately at the sight of these presents, without delay or excuse, to inspect and overlook all your walls, ditches, towers, and ammunition, proper for the defence of the said city.

And we, by these presents, give you full power and authority to distrain and compel all and singular owners of houses or rents in the said city, or merchants, or strangers, inhabiting the same, by the seizure of their bodies or goods, to be aiding towards the security of the walls, bulwarks, or towers, as you in your own discretion shall think fit to ordain for the making other useful and necessary works about it, punishing all those that are found to contradict or rebel against this order by imprisonment, or what other method you think fit.

ON THE PRESENT STATE OF THE ARTS IN ITALY.

II.

We have already alluded to the state of the arts connected with architecture in Italy, as described in Mr. Wilson's Report to the Society of Arts in Scotland.

In briefly noticing the art of painting in Italy, Mr. Wilson speaks of its gradual decline, and the absence of any indications of its recovery. It is trammelled by academic system. The Roman school is distinguished by a cold affectation of classic purity, and a want of energy and nature in all its productions. Yet we must not remain blind to the good qualities of that school; many Roman artists draw exceedingly well, and they evince this power in the fine and large cartoons which they are in the habit of executing before they commence a picture. If the student of this country does not draw long enough, the Italian student, in acquiring his mastery of the crayon, seems to forget that he is ever to use the brush; and the Italian artists rarely prove even tolerable colourists, while their prejudices as to the adoption of many necessary processes in painting, and which were unquestionably in use amongst their great predecessors, are invincible. "This was illustrated in an amusing manner one day in the Florence Gallery. An Italian artist was busy copying a Venetian picture, and my late friend Mr. James Irving happening to look at his work, remarked to him that he never could hope to imitate the brilliancy of the original without glazing. 'I know that,' said the Italian, 'but I won't glaze.'"

Mr. Wilson found the art, as practised in Florence, much in the same state as at Rome. An endeavour had been made to produce richness of colouring in addition to correct drawing, but they had only succeeded in arranging on their pictures in brilliant juxtaposition rainbow hues, without attaining harmonious effect. At Naples, painting was at a low ebb; at Genoa, lower still; at Venice, little better; but at Milan it reckoned among its professors clever men in some departments of the art. Fresco painting is still pursued in Italy, but with most success by Germans.

Some great names have lately marked the progress of engraving in Italy. Most of these distinguished artists are now dead, but several of Raphael Morghen's pupils are highly esteemed; the best are established at Milan, where many fine and important works have been executed. Ludwig Gruner and Rusweigh, both Italianized Germans, promise to revive the style of Marc Antonio with success. The Italian engravers are most successful in their works from historical pictures; but a practice which they follow seems calculated to prevent their imitating with fidelity the style and feeling of the artist whose production they copy. They engrave from highly-finished chalk drawings copied from pictures by artists who devote themselves to this branch; however faithfully these may apparently copy, it is certain that their drawing will, to a great extent, exhibit their peculiarities of mind and feeling, and as the engraving must likewise be marked by the style of its author, the process is not favourable to the production of engravings of a faithful character. This practice is, however, forced upon the Italian engraver, as he can neither transport gallery pictures, nor frescoes, to his study. The landscape engravers of Italy are not successful. Frigid imitators of Woollet in general, their works are far inferior to those of that admirable master.

Sculpture, revived from infancy by the genius of Canova, is the art which stands highest in Italy. Eminent sculptors of various nations make Rome their residence, and if to those professors is assigned the title of the Roman school, then this school must be estimated as the first school existing. It is an important fact, however, that before Canova revived the sculpture of Italy, England could boast a succession of very eminent sculptors. Mr. Wilson, speaking of the estimation in which Flaxman is held in Italy, tells us that the following remark was made by a distinguished Italian artist: "Flaxman was the greatest sculptor the world has known since the time of the Greeks."

Mosaic work, and cameo-cutting, have been carried to high perfection at Rome. The former art attained its greatest perfection in the last and present century. Roman mosaic, as now practised, is the production of pictures by connecting together numerous minute pieces of coloured marble, or artificial stones; these are attached to a ground of copper by means of a strong cement of gum mastic, and other materials, and are afterwards ground and polished as a stone would be to a perfectly level surface; by this art not only are ornaments made on a small scale, but pictures of the largest size are copied. In former times the largest cupolas of churches, and not unfrequently the entire walls, were encrusted with mosaic. The most remarkable modern works are the copies which have been executed of some of the most important works of the great masters for the altars in St. Peter's. These are in every respect perfect imitations of the originals; and when the originals, in spite of every care, must change and perish, these mosaics will still convey to distant ages a perfect idea of the triumphs of art achieved in the fifteenth century. The government manufactory in Rome occupies the apartments in the Vatican, which were used as offices of the Inquisition. No copies are now made, but cases of *smalti*, or artificial stones, are shown, containing, it is said, eighteen thousand different tints. Twenty years were employed in making one of the above-mentioned copies. The pieces of mosaic vary in size from an eighth to a sixteenth of an inch, and eleven men were employed for that time on each picture. In 1775 Signor Raffaelli first thought of preparing the *smalti* in what may be termed very fine threads, and this proved a great advantage. The pastes or *smalti* are manufactured at Venice in the shape of crayons, or little sticks of sealing wax, and are afterwards drawn out by the workman at a blow-pipe into the thickness he requires, often almost to a hair, and now seldom thicker than the finest grass-stalk. For tables and large articles the pieces are thicker, but the beauty of the workmanship, the soft gradation of the tints, and the cost, depend upon the minuteness of the pieces, and the skill displayed by the artist. A ruin, a group of flowers or figures, will employ a good artist about two months when only two inches square, and a specimen of such a description costs from five pounds to twenty pounds, according to the execution; a landscape six inches by four would require eighteen months, and would cost from forty to fifty pounds, no adequate renumeration for the time bestowed. The finest ornaments for a lady, consisting of necklace, ear-rings, and brooch, cost forty pounds. For a picture of Pæstum, eight feet long, and twenty inches broad, on which four men were occupied for three years, one thousand pounds was asked.

The mosaic work of Florence entirely differs from that of Rome, being composed of stones inserted in comparatively large masses; it is called work in *pietra dura*. The stones are all more or less of a rare and precious character. In old specimens the most beautiful works are those in which the designs are of an arabesque character. One of the most remarkable specimens is an octagonal table in the *Gabinetto di Baroccio*, in the Florence Gallery. It is valued at twenty thousand pounds, and was commenced in 1623 by Jacopo Datelli, from designs by Ligozzi. Twenty-two artists worked upon it without interruption till it was terminated in the year 1649. Attempts at landscapes and the imitation of natural objects were usually failures in former times,—mere works of labour which did not attain their object; but of late, works have been produced in this art in which are represented groups of flowers and fruits, vases, musical instruments, and other

compatible objects, with a truth and beauty which excite the utmost admiration and surprise. These pictures in stone, however, are enormously expensive, and can only be seen in the palaces of the great. Two tables in the Palazzo Pitti are valued at seven thousand pounds, and this price is by no means excessive. These are of modern design on a ground of porphyry, and ten men were employed for four years on one of them, and a spot is pointed out, not more than three inches square, on which a man had worked for ten months. But Florentine mosaic, like that of Rome, is not merely used for cabinet tables or other ornamental articles; the walls of the spacious chapel, which is used as the burial place of the reigning family at Florence, are lined with *pietra dura*, realizing the gem-encrusted halls of the Arabian Tales. Mr. Wilson remarks that the effect in this chapel is far from pleasing, and thinks that the art might be advantageously confined to the production of small ornaments, for which it is eminently adapted. He notices the imitation of *pietra dura* now made in Derbyshire, where the inlaying is only done in veneers, and not in the solid as at Florence. The Duke of Devonshire's black marble is inlaid with the Derbyshire spars, malachite, &c.; and were a little more taste and skill exhibited, the work would be highly valued, as the materials, especially the black marble, are beautiful.

Cameo-cutting is pursued with most success at Rome, where there are eminent artists now living. Cameos are of two descriptions, those cut in stone, or *pietra dura*, and those cut in shell. Of the first, the value depends on the stone, as well as in the excellence of the work. The stones most prized now are, the oriental onyx, and the sardonyx, the former black and white in parallel layers, the latter cornelian, brown and white; and when stones of four or five layers of distinct shades or colours can be procured, the value is proportionably raised, provided always, that the layers be so thin as to be manageable in cutting the cameo so as to make the various parts harmonize. For example, in a head of Minerva, if well wrought out of a stone of four shades, the ground should be dark grey, the face light, the bust and helmet black, and the crest over the helmet brownish or grey. Next to such varieties of shades and layers, those stones are valuable in which two layers occur of black and white of regular breadth. Except on such oriental stones no good artist will now bestow his time; but, till the beginning of this century, less attention was bestowed upon materials, so that beautiful middle-age and modern cameos may be found on German agates, whose colours are generally only two shades of grey, or a cream and a milk white, and these not unfrequently cloudy. The best artist in Rome in this department is Signor Girometti, who has executed eight cameos of various sizes, from an inch and a half, to three inches and a half in diameter, on picked stones of several layers. The subjects being from the antique. They form a set of specimens for which he asks three thousand pounds. A single cameo, of good brooch size, and of two colours, costs twenty-two pounds. Portraits in stone by the excellent artists Diez and Saulini may be had for ten pounds; these cameos are all wrought by a lathe with pointed instruments of steel, and by means of diamond dust. Shell cameos are cut from large shells found on the African and Brazilian coasts, and generally show two layers, the ground being either a pale coffee-colour, or a deep reddish orange; the latter is most prized. The subject is cut with little steel chisels out of the white portion of the shell. A fine shell is worth a guinea in Rome. Copies from the antique, original designs, and portraits, are executed in the most exquisite style of finish, and perfect in contour and taste, and it may be said that the Roman artists have obtained perfection in this beautiful art.

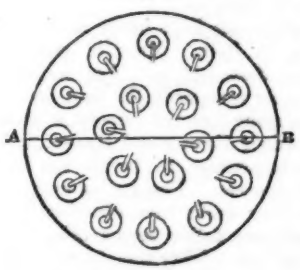
Good shell cameos may be had at from one to five pounds for heads, and from three to four pounds for the finest large brooches; a comb costs ten pounds, and a complete set of necklace, earrings, and brooch, costs twenty guineas. A portrait can be executed for four or five pounds, according to the workmanship.

The goldsmiths of Italy produce ornaments which are remarkable both for taste and workmanship, especially those of Genoa and Venice. The art of making bronze ornaments and figures is one in which the Italians also show much taste and dexterity. They annually sell numbers of antique bronzes, of modern fabric, to *soi disant* antiquaries, who, however, neither possess that extensive learning, nor profound experience and correct taste, necessary to constitute the character.

The manufacture of glass is pursued with great success in Venice: numerous glass ornaments for ladies come from thence. The ruby glass of 1500 and 1600 can now be imitated so as to make imposition a famous trade, the false being only distinguishable by weight. Glasses are also made in which white threadlike lines of arsenic are incorporated. The process by which the Venetians make sheet glass differs from ours. Instead of being formed into immense circular sheets, it is blown into cylinders of considerable length and diameter; the workman then cuts off the two ends of his cylinder, dexterously slits it down on one side, and spreads it flat on a table in an oven. By this process sheets of a sufficient size are made without loss.

The velvets of Genoa, and the exquisite turned ware of the same place, the straw hats of Tuscany, the silks of Florence, the embroideries of Rome, the musical instruments and musical strings, are all samples of skill creditable to the Italians. Mr. Wilson classes the making of maccaroni among the arts creditable to the Neapolitans, and says that as he never met with any one who could guess by what process maccaroni is made into pipes, he made a drawing of the perforated copper plate through which it is squeezed. Fig. 1 shows a plan of this plate, and fig. 2 the section on A, B

Fig. 1.



MACCARONI PLATE.

Fig. 2.

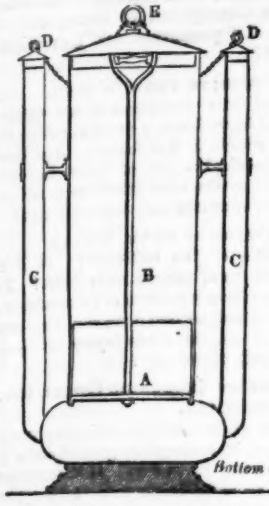
SECTION ON A B.

Fig. 3 represents a section of an apparatus used in Italy for warming baths. It is made of copper; the live charcoal is put upon the grating A, which is put into the stove, by means of the handle B, the fire is kept alive by air supplied through the tubes CC, and when immersed in the water of a slipper bath, this light and portable apparatus will heat it in a quarter of an hour. DD are lids of brass to be taken off when the heater is not in use. E is a lid kept on when the heater is in the water.

Thus we see that the Italians are still remarkable, as they have been for nearly three thousand years, for their taste and skill in many beautiful arts; so that we may profitably consider their superiority in these respects with a view to our own improvement, and while we

lament their moral and political degradation, we are not at liberty to despise a people thus remarkable for their ingenuity and skill.

Fig. 3.



ITALIAN COPPER BATH-HEATER.

Fig. 4.

PLAN OF CAST-IRON GRATING FOR FIRE AT A.

CURIOUS CHESS PROBLEMS.

IV.

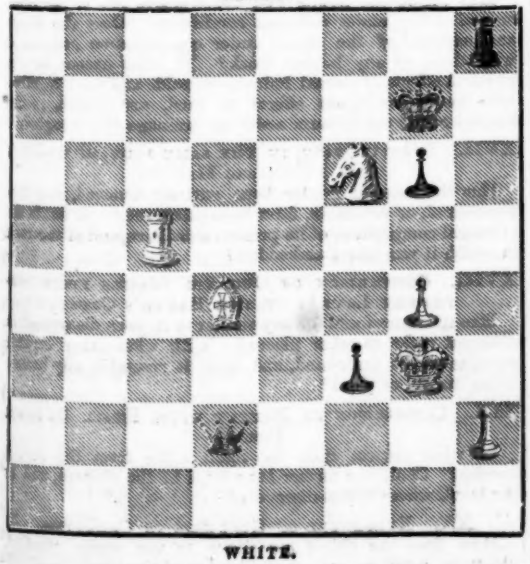
THE following is a singular situation, and well illustrates the value of "the move" at Chess; for if White has the move he can checkmate in four moves; and if Black has the move, he also can give checkmate in four moves. It is also a curious feature in this problem that both the Kings are checkmated on the same square.

We would advise the young student to regard this position as two separate problems, in the first of which White moves first, and gives mate in four moves; and having discovered this, he is again to set up the pieces as in the diagram, and proceed to the solution of the second problem, in which Black moving first, gives mate in four moves.

i. *White moving first is to give checkmate in four moves.*

ii. *Black moving first is to give checkmate in four moves.*

BLACK.



WHITE.

ON ARRANGING NATURAL OBJECTS IN A DOMESTIC MUSEUM.

THE mechanical structure of an object-case, or domestic museum, was described in a recent number of the *Saturday Magazine*, and we would now attempt to lessen the confusion that must necessarily follow the first collecting of various objects, by giving a drift to the student's observations. Young collectors are generally anxious to learn the names of things, and doubtless the knowledge of names is an index to what the library contains about the objects; but yet it will be seen, that it is only in public museums it is necessary to begin by labelling each specimen with its specific appellation. Supposing a national museum existed, a department of which were devoted to the preservation of every British natural object, whether organic or mineral, and that these were further classified and labelled, (as the minerals have been in the *Museum of Economic Geology* in London,) this would enable the humblest visitor, whether possessed of books or not, to identify whatever fraction of creation he had appropriated to himself as a means of pleasure and instruction. For the sake of advancing wholesome information, and spreading a disrelish for debasing kinds of recreation, it is highly desirable that local museums should be founded even in every town for the purpose of preserving, not the rare products of the East or West, but specimens of the neighbouring rocks, soils, plants, animals, both recent and in a fossil state, &c. Young persons, and not the young only, would be equally delighted and surprised to find that such were within their own reach, and only required the exercise of observation. It is evident, to render these institutions available for their ends that every object ought to be correctly named and classed.

But the purposes of domestic museums are more special. The private *curator* (as the keeper of a museum is called) is, for the most part, his own collector; the specimens are chosen more immediately for his own intellectual use; their features are consequently too familiar to him to require labels to recall their names. Moreover, the mind is too apt to rest satisfied with the acquisition of a name, receiving that as a part of actual knowledge which is but a changeable and artificial term. We would therefore advise the beginner not to be too anxious about, nor to label his objects with, the names; but to write on each its *locality*, or the name of the place where it was picked up. To know where anything was found leads to a knowledge of the atmospheric, geological, and other conditions, without which its natural history can never be completed.

It is, however, necessary that the general arrangement of the collection should be previously mapped out in the student's mind. We shall not do him the injustice of supposing that he gathers stones for the sake of stones; but believe him to be inspired with a love of the order of creation. Natural objects are raised above the narrower feelings that, justly enough, are attached to ordinary property. Other things increase in value as they increase in number; but the naturalist does not care to multiply specimens of the same species except for the pleasure of enriching the cabinets of friends. A thousand individuals will not impart to him more delight, or more knowledge, than one well-preserved and perfect specimen, and the ends of science lie far beyond even the rarest collection of nature's gems. Each inquirer will necessarily choose for himself certain paths to lead him to these ends; but, whatever these may be, there will be a mechanical convenience in choosing as many subjects for research as he has trays in his cabinet. The model object-case (a drawing and description of which may be seen at page 220,) contains room for twenty trays. We shall, therefore, select twenty separate paths for investigation, such as appear most likely to strengthen the powers of reflection, and to widen the ken of observation.

For the sake of affording printed labels to any who may be inclined to follow out our plan, these several subjects for investigation are printed below, in such a form as will serve for labels to the trays. If required for this purpose, let the reader order another copy of this number of the *Saturday Magazine*, to complete his volumes, and cut out of the duplicate the following labels, which are intended to be pasted on the face of the trays. The questions that form a part of each label explain the chief branches of inquiry, and will either suggest their answers, or at least serve to mark the limit of our knowledge*.

I. GEOGRAPHICAL DISTRIBUTION.

Where was the object found?

(*Please to write the answer to this question, and fix it on the object forthwith.*)

The name and direction of the town nearest its locality? If a mineral, or fossil, in what rock; if a plant, or animal, on what soil.

II. ATTRACTION OF MATTER.

What is the texture, structure, and density of the body? Is it hard, or porous, brittle, elastic, malleable, ductile, fibrous, or slaty? Is it irregular in form, or crystalline, &c.?

III. MATTER IN RELATION TO LIGHT.

What is the colour of the substance? Is it opaque, translucent or transparent? The degree in which it absorbs, reffects, and refracts solar and other kinds of light? Is it phosphorescent? What phenomena of light does it exhibit during friction and combustion?

IV. MATTER IN RELATION TO HEAT.

What is the natural temperature of the object? In what degree does it absorb, reflect, conduct, transmit, and radiate solar and artificial heat? How much heat does it take to fuse, boil, vaporize, and dissipate it? and how does it conduct itself in the flame of the blow-pipe?

V. MATTER IN RELATION TO ELECTRICITY.

Does the object conduct or insulate electricity, and in what degree? Is it capable of direct decomposition by the electric current?

VI. CHEMICAL COMPOSITION.

Is it a metallic, earthy, vegetable, or animal body? Is it simple or compound; and if compound, what are the relative proportions of its elements?

VII. GROWTH OF INORGANIC BODIES.

Is the substance soluble in, and has it been deposited from, water, or does it bear traces of the action of heat? Is its figure shapeless and confused, or symmetrical and crystalline; and if a crystal, what is its form, and is this form primary or secondary?

* As definite terms are necessary for these permanent labels, and as explanations of these would be out of place in the text, it is hoped the following Glossary will assist our younger readers.

Attraction, the force that binds atom to atom and connects world with world.

Calcareous, containing the elements of lime.

Chemical composition, constitution of a body with respect to the kinds and properties of its ingredients.

Cohesion, the relation between the component parts of a body, by which they cling together.

Conduction. Heat is said to be *conducted* when it travels through a body without disturbing the internal arrangements of its particles.

Decomposition, the separation of a compound body into its component parts.

Ductile, capable of being drawn out into threads, or wire.

Fossils, literally, things dug out of the earth; but properly, the mineralized remains of animals and plants.

Igneous rocks; rocks formed by means of heat.

Inorganic, not possessing any trace of vegetable or animal organs.

Insulate; when a body, containing a free quantity of heat, or electricity, is surrounded by non-conductors, it is said to be *insulated*.

Iridescent, marked with the colours of the rainbow.

Malleable, capable of being spread out by hammering.

Organic, constructed for sustaining life.

Phosphorescent, exhibiting light without combustion.

Refraction, an abrupt change in the direction of a ray of light, as it passes from a body of lesser, to one of greater, density.

Rocks, in Geology, not only those hard masses commonly so called; but clay, sandstone, or even beds of sand, provided these occur in layers.

Siliceous, composed of *silica*, or the matter of flint.

Symmetry. "The orderly and exactly similar distribution of two, three, and four, or any number of parts, is symmetry. Thus the bodies of animals consist of two equal and similar sets of members on their right and left sides. Some flowers consist of three, or five, equal sets of organs, similarly and regularly disposed."—DANIELL.

Transformation. Change of form and function, without alteration of chemical composition.

Translucency, imperfect transparency.

VIII. TRANSFORMATION OF INORGANIC BODIES.

What were the chemical components of the object in the first instance? Do these component elements possess a stronger attraction for certain other bodies than for each other? Could the substance have been exposed to the action of these bodies? Was the atmosphere, or water, heat, or light (as in the blackening of "permanent ink"), or electricity, the transforming agent?

IX. CHEMICAL DEPOSITS FROM WATER.

Was the deposit produced from marine or inland waters? What salts, or other mineral ingredients, are contained in the water near to where, or in which, it was found? Are these separated directly by the chemical action of other waters or contiguous soils, or indirectly by the vital functions of aquatic animals, as of corals? Has it encrusted any organic forms?

X. MECHANICAL DEPOSITS FROM WATER.

The hardness and texture of the sediment? Is it of uniform composition, or made up of various ingredients? Do vegetable, or animal, remains form a portion of its substance? Does it occur in layers as if it had settled down and hardened without disturbance, and if so, do these layers or strata appear to have been afterwards broken up?

XI. MECHANICAL ACTIONS OF INORGANIC BODIES UPON EACH OTHER.

Does the body bear marks of mechanical violence; was it crushed by pressure, shattered by concussion, ground down by friction, or partially washed away by water? Has its surface been unequally acted upon, so as to leave some harder portions in relief?

XII. EFFECTS OF TERRESTRIAL HEAT.

Was the substance found near an active or extinct volcano, or can it possibly be the product of artificial heat? Is it crystalline, or porous, and does it contain the least trace of organic forms?

XIII. COMPARISON OF THE ORGANS OF PLANTS WITH EACH OTHER.

In what respect does the organ vary in size, form, relative situation as to other parts of the plant, mode of development, and function, from the same organ as seen in other species of plants?

XIV. TRANSFORMATION OF THE ORGANS OF PLANTS.

Does the form exhibit a greater or less degree of growth than is usual to the organ? Has the peculiarity been caused mechanically, as by an insect, or vitally, as from a lack or excess of food? Has one organ been substituted for another, and what has been the order of its development with regard to other portions of the plant?

XV. COMPARISON OF THE ORGANS OF ANIMALS WITH EACH OTHER.

Does the organ in question differ in size, form, situation, mode of development, and function, from the corresponding organ in other animals?

XVI. COMPARISON OF ANIMAL INTELLIGENCE WITH HUMAN REASON.

How far do the habits and constructive art of the same animal differ under different conditions? Does the design and material of the object under consideration correspond with those of any human work? To what extent do the physical effects of animal industry coincide and work together with man's intelligent efforts for food, and health, as the borings of the earth-worm assist the drainage of the engineer?

XVII. SUBSTITUTION, IN THE SAME BODY, OF ORGANIC FOR INORGANIC MATTER.

Has the organic matter been entirely removed, and only the animal, or vegetable, form been preserved? What is the chemical composition of its present substance, and of the rock in which it was found embedded?

XVIII. COMPARISON OF ORGANIC FOSSILS FROM DIFFERENT LAYERS OF THE EARTH'S CRUST.

Has the same fossil, or any similar to it, been discovered in different rocks at other places? With what other organic remains was it associated, and does it resemble any known living animal or plant?

XIX. COMPARISON OF RECENT WITH FOSSIL ORGANIC FORMS.

In what respect does the fossil differ from the recent species? Could the former have lived in the climate, and at the level, where it was discovered?

XX. EVIDENCES OF GOODNESS IN CREATION.

How does the object contribute to the wants, comfort, pleasures, intelligence, and civilization of mankind?

If we take to our cabinet any natural specimen, and examine it at each tray, subjecting it to these and other questions that will occur upon reflection, the fruit will be a mass of facts about the object itself, besides the knowledge it will contribute to several of the leading paths of investigation. The path (or tray) which it best illustrates, will be its final place in the museum. Moreover, the *name* of the object, searching for which would have been tedious at the outset, will, in most cases, come uncalled for during the course of this examination.

Let the reader suppose this method repeated by a young person for the space of several months. His trays would each tell their own story. He will have arranged *subjects* after an intellectual method, and not have been sorting mere *objects* as things of value in themselves. A delightful hour of one's evening at home may be spent by placing any one tray upon the table, and drafting from other sections of the cabinet every specimen which may illustrate, in a subordinate way, the truth in question. In short, a series of familiar household lectures might be prepared, the subjects of which, for the first twenty exhibitions, would be suggested by the labels on the trays. If several sheets of paper were pasted together, a rough outline map of England drawn upon it on a large scale, and the objects arranged on this according to their localities, an expressive Map of English Geology would be constructed for the opening lecture.

The specimens should be replaced with care, and upon the next occasion the principle of Attraction might be made visible in its various degrees of cohesion in the hard, soft, brittle, elastic, tough, and ductile bodies, which the second tray contains. This would be followed by an exhibition of translucent, transparent, opaque, coloured, iridescent, crystalline, phosphorescent, and other bodies, which teach the phenomena of Light. The same with those of Heat and Electricity.

An extra table would be wanted for spreading out almost all the objects of the cabinet, to illustrate their Chemical Composition. Bodies, the most unlike in form, would be shown as similar in nature, and diagrams of the combinations of undecomposed bodies would unravel to the eye the apparent confusion of the earth's materials. The seventh label would include the beautiful science of Crystallization. The young lecturer might find, perhaps, a flint, upon a broken surface of which had been deposited a layer of chalcedony, which, chemically, is the same as flint. This would enable him to say that silica, the matter of flint, is held in solution by water which deposits it upon any clean flinty surface. This again would account for calcareous sea-eggs that are found in chalk, sometimes perfectly filled with solid flint. Siliceous sand had probably found entrance at the narrow aperture of the shell, and served as a nucleus for the deposit of the flint dissolved, in minute quantities, in water. He would most likely possess a sea-egg, the perfect calcareous shell of which had been filled with iron pyrites (native sulphuret of iron). If he could not explain how the elements of this metallic body radiated fibrous crystals within the unbroken walls of a globular shell-fish, he might at least admit the principle of successive growths—of perpetual creation, in the mineral, as well as in the animal and vegetable, kingdom.

In the next tray would naturally follow, evidences of the continual transformation (decomposition) of material bodies, from the rust upon a needle, to the disintegration (crumbling) of a granite rock. The stony scale of lime from the inside of a boiler would introduce our little circle to *tufa*, or the salts of lime, which are thrown down in such abundance from the volcanic waters of Italy for example, and of which so large a portion of the city of Rome is built. An examination of clays and other mechanical deposits from water (see Label X.), would naturally precede an exhibition of shingles, gravels, sands, &c. (Label XI.), the forms and scattering of which result from the motive force of water. The effects of terrestrial heat would lead to the subject of volcanoes, and a tray of lavas and other igneous rocks (No. XII.), as granite, porphyry, basalt, &c., would help to explain the nature and extent of the upheavings which the crust of the earth has suffered.

Advancing from inorganic to organic matter, an easy step would be to arrange on sheets of paper the leaves of plants according to their variations, in form, position, function, &c., and so on with the petals, seed-vessels, and other vegetable organs (Label XIII.), that are adapted for an object-case. The stunted, excessive, or irregular growth of certain parts of plants (Label XIV.), include a class of exceedingly curious and important facts that in many instances explain the order in which the several organs are developed, and the relative importance and balance of their functions. A comparison of certain animal organs (No. XV.), as the teeth, for instance, considered in reference to the nature of the food they were destined to break down, will be found an excellent exercise of observation. The nest of the wasp, and a variety of other productions of animal intelligence (No. XVI.), would serve to teach the line between stationary instinct, and progressive reason. Amongst the deposits from water in the ninth and tenth trays, the remains of animals and plants will have been observed; specimens of these should be collected to illustrate the chemical process of their conversion (see Label XVII.) It is not enough to say that wood or shells are petrified; but what is the chemical nature of their stony casts? How have they retained their forms, yet lost their organic elements? The results of such investigations will excite our wonder and enlarge our minds if they do not always satisfy our curiosity.

If we bring together a selection of the various fossils that are found in different rocks (18th tray), we shall be able to explain the exquisite order in which the simple preceded the more complex animal and vegetable creations. Many of these fossil forms will be recognised as similar to existing species of animals and plants. A very attractive exhibition therefore is formed by placing side by side the fossil and the recent object, and comparing the past and present races of organic beings Lastly, to dwell upon the goodness of creation, will very properly conclude this survey of our world at home.

F.

I HAVE always found in the disposition of the children of the field a more determined tendency to religion and piety than amongst the inhabitants of towns and cities, and the reason is obvious—they are less acquainted with the works of man's hands than with those of God; their occupations, too, which are simple, and requiring less of ingenuity and skill than those which engage the attention of the other portion of their fellow-creatures, are less favourable to the engendering of self-conceit and sufficiency, so utterly at variance with that lowliness of spirit which constitutes the best foundation of piety. The sneerers and scoffers at religion do not spring from amongst the simple children of nature, but are the excrescences of over-wrought refinement; and though their baneful influence has indeed penetrated to the country, and corrupted man there, the source and fountain-head was amongst crowded houses, where nature is scarcely known. I am not one of those who look for perfection amongst the rural population of any country; perfection is not to be found amongst the children of the fall, wherever their abodes may happen to be; but, until the heart discredits the existence of a God, there is still hope for the soul of the possessor, however stained with crime he may be, for even Simon the magician was converted; but when the heart is once steeled with infidelity, infidelity confirmed by carnal wisdom, an exuberance of the grace of God is required to melt it, which is seldom manifested; for we read in the blessed book that the Pharisee and the wizard became receptacles of grace, but where is there mention made of the conversion of the sneering Sadducee, and is the modern infidel aught but a Sadducee of later date?—BORROW's *Bible in Spain*.

EXTRAORDINARY RESOLUTION AND PRESENCE OF MIND.

On the evening of the 24th of August, 1843, a young lady and a clergyman were walking together on the sea-shore at Yarmouth, near the Pillar erected to the memory of Lord Nelson. As they approached the small tavern kept by the old pensioner who has charge of the monument, a gentleman on horseback passed them, carrying a glass tumbler in his hands. He rode directly into the sea, and leaning on one side, evidently with the intention of filling the tumbler, overbalanced himself and fell into the water. The horse plunged and kicked, and the lady distinctly saw its heels strike the head of the gentleman, after which it got clear from him, and made for the shore. The young lady watched its movements with intense anxiety, but seeing the gentleman lying perfectly helpless, each succeeding wave rolling him further into the sea, and no assistance at hand, she herself rushed into the waves, which rose nearly to her waist. On approaching the gentleman, she perceived that he was quite insensible, blood flowing from the wound in the head, made by the kick of the horse, and the tumbler, though broken, firmly grasped in his hand. Feeling that not a moment was to be lost, she seized the body by the arms, and exerting an unusual energy, drew it out of the reach of the succeeding billows to the shore. Here she was joined by two gentlemen, friends of the rider, who had been looking out of the tavern window, and seeing his horse return alone, had come down to the beach in search of their friend. To them she committed her charge, and then returned greatly exhausted to her lodgings. Singular to say, her companion, the clergyman, was so paralyzed by the event, that he was unable to move from the spot on which he stood. The young lady who performed this generous act, is the daughter of Captain Long, of Colton, near Yarmouth.

THOUGHT AND DEED.

Full many a light thought man may cherish,
Full many an idle deed may do;
Yet not a deed or thought shall perish—
Not one but he shall bless or rue.

When by the wind the tree is shaken,
There's not a bough or leaf can fall,
But of its falling heed is taken
By One that sees and governs all.

The tree may fall and be forgotten
And buried in the earth remain;
Yet from its juices rank and rotten
Springs vegetating life again.

The world is with creation teeming,
And nothing ever wholly dies;
And things that are destroyed in seeming,
In other shapes and forms arise.

And Nature still unfolds the tissue
Of unseen works by spirit wrought;
And not a work but hath its issue
With blessing or with evil fraught.

And thou may'st seem to leave behind thee
All memory of the sinful past;
Yet oh! be sure thy sin shall find thee,
And thou shalt know its fruits at last.

CHARLES RANN KENNEDY.

There is no unmixed good in human affairs: the best principles, if pushed to excess, degenerate into fatal vices. Generosity is nearly allied to extravagance—charity itself may lead to ruin—the sternness of justice is but one step removed from the severity of oppression. It is the same in the political world: the tranquillity of despotism resembles the stagnation of the Dead Sea; the fever of innovation, the tempests of the ocean. It would seem as if, at particular periods, from causes inscrutable to human wisdom, an universal frenzy seizes mankind, reason, experience, prudence, are alike blinded; and the very classes who are to perish in the storm, are the first to raise its fury.—ALISON'S *History of Europe*.

THE STRENGTH OF SUPERSTITION.

An English gentleman residing in India, who was fond of natural and experimental philosophy, was intimate with a liberal-minded Brahmin. These friends generally passed the morning together in the pleasing walks of science. The Brahmin read English books, searched into the Encyclopædia, and profited by the best philosophical instruments. The gentleman, on receiving a valuable solar microscope as a present from Europe, showed it with rapture to his Hindoo friend. It is well known that the superstition of the Brahmins forbids the eating or killing of any animal, even of the minutest insect, from the belief that after the death of man the human soul enters into the body of one or other of the lower animals. With the view of proving the foolishness of this practice, the Englishman showed to the Hindoo, in the field of the microscope, the innumerable animalculæ, which we unavoidably devour in every fruit and vegetable we eat.

After a full display of the wonders laid open by the new apparatus, instead of being delighted the Brahmin became unusually thoughtful, and at length silently withdrew. On his next visit he requested his friend to sell him the microscope, who objected, observing that it was a present from a friend in Europe, not to be replaced, and while in his possession would afford them mutual gratification. The Brahmin offered him a very large sum of money, or any Indian commodity of equal value, in hopes of obtaining it, without effect; at last the gentleman, overcome by incessant importunity at every repeated visit, presented him with the microscope. A momentary gleam of joy flashed across the Brahmin's countenance on obtaining possession of the object he so ardently desired. They were then in a veranda overlooking a garden in which was an artificial rock-work composed of flints and rough stones. The Brahmin, grasping the instrument, descended, with a quicker motion than is customary with his caste, into the garden; where, seizing a large stone, he laid the microscope upon the lowest step of the veranda, and instantaneously smashed it to pieces before his astonished friend could prevent him.

The Englishman upbraided him with ingratitude, ignorance, and fanaticism. As usual with his caste, he bore all patiently, and respectfully withdrew, saying, when he was cool he would pay him a visit and explain his reasons. Justification was deemed impossible. The Brahmin returned a few days afterwards, met with a polite if not a welcome reception, and thus addressed his friend:—"Oh that I had remained in that happy state of ignorance wherein you first found me! yet while I confess that as my knowledge increased, so did my pleasure, until I beheld the last wonders of the microscope; from that moment I have been tormented by doubt, and perplexed by mystery; my mind, overwhelmed by confusion, knows not where to rest, nor how to extricate itself from such a maze. I am miserable, and must continue to be so until I enter upon another stage of existence. I am a solitary individual among fifty millions of people, all educated in the same belief with myself! all happy in their ignorance! So may they ever remain! I shall keep the secret within my own bosom, where it will corrode my peace and break my rest; but I shall have some satisfaction in knowing that I alone feel those pangs, which had I not destroyed the instrument might have been extensively communicated, and rendered thousands miserable! Forgive me, my valued friend! and, oh! convey no more implements of knowledge and destruction!"

Could this man have been instructed in the sublime truth of religious philosophy, could he have been made the means of imparting a true system of natural theology, happy might have been the consequences! For a Christian philosopher, after the minutest investigation of which he is capable, in the great scheme of nature, with a regulated though fervid rapture, finds his mind in a higher state of preparation for the truth and consolation of the Gospel.—FORBES'S *Oriental Memoirs*.

A wealthy citizen of Athens complained that Aristippus the philosopher, in requiring five hundred drachmas* for the instruction of his son, had demanded as much as would purchase a slave. "Purchase one, then, with the money," said the philosopher, "and you will be master of two."

* A drachma was worth about seven-pence of our money.

LONDON: JOHN W. PARKER, PUBLISHER, WEST STRAND.